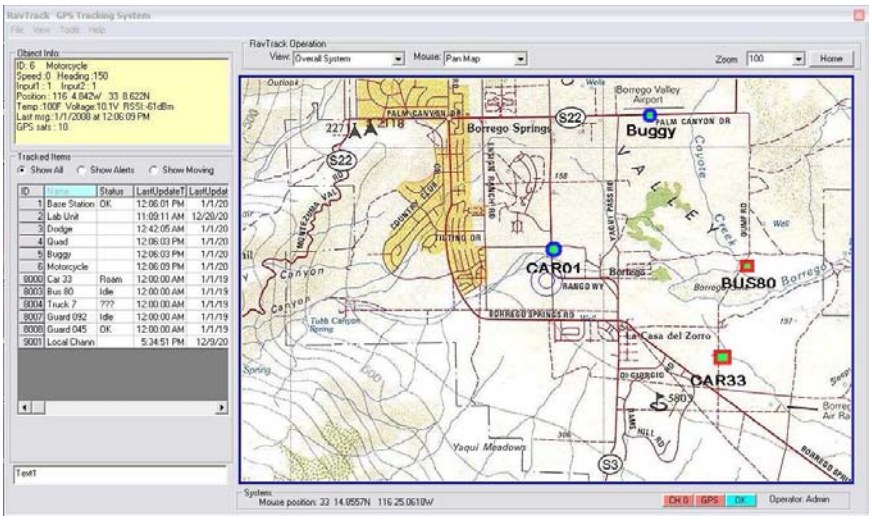
RavTrack PC

RavTrack PC AVL/Tracking Software Application

RavTrack™ PC by Raveon is a PC application for displaying, tracking, alarming, and logging the activity of *GX and GS GPS* Transponders.



This easy-to use PC application graphically shows the location and status of cars, trucks, people, or anything equipped with RavTrack Transponders. The displayed map may be any graphic image, bitmap, or .jpg.

RavTrack PC Features:

The features below are what make a RavTrack PC the right choice for real-time tracking:

1) ***Real-time***. See where your vehicles are *NOW*, not a few minutes ago. Position and status updates are available as quickly as every second. No other UHF tracking system has as fast an update rate as *RavTrack*.

2) ***In the Office or In the Field.*** Track your vehicles and assets at field offices, temporary work sites, remote locations, or in the office. The RavTrack PC is a complete stand-alone tracking system. No server required. No Internet required. No satellite required. A single PC and a Raveon RV-M7 GPS transponder is all that is required. The map on the display may be any graphics image, scanned map, or photo you choose.

3) ***Visualize your Operation.*** The displayed map can be your city, or your construction site, or your park, or your Golf Course, or your city. See where people are, or should be. See where they aren't and should. *RavTrack PC* can show you your business in a way no voice system can. Zoom and switch between different maps with a click of the mouse.

4) ***Geo-Fence monitoring.*** RavTrack PC users may create geo-fences on the map around areas like keep-out zones, off-limit areas, must-patrol areas, and environmentally sensitive areas, and then have the system alert when geo-fence rules are violated.

5) ***One-Click status.*** Tracking is one thing it does well, but do you want to know status also? One-click on an icon on the map or click an entry in the tracked-object table, and the user can see complete vehicle status including location, distance, heading, velocity, I/O status, temperature, voltage, altitude, and radio signal strength.

6) ***Custom Alerts***. Knowledge is power, and RavTrack PC gives you the power over your moving assets. Know where they are, when they move, how-long they are idle, or if they are miss-used. The *RavTrack PC* operator can be alerted to various transponder-specific events such as speeding, proximity to Points of Interest, Geo-fence violations, and digital input status.

7) ***Database Driven***. The information on all units being tracked is stored in a Microsoft Access SQL database. All movements and events are logged in a separate MS Access SQL database. Users may use Access and other SQL tools to create custom reports or interface with the data in real-time.

8) ***Single or Multi-User.*** The software may be run in a single-user stand alone configuration on one PC, or operated in a multi-user configuration where multiple *RavTrack PC* users can monitor the system and create their won alarms.

9) ***Log Replay*** The user may select log entries to replay on the map, to show the past location and status information.

10) ***Up to 6 radio Channels.*** Expand the coverage with multiple radio channels. *RavTrack PC* will allow up to 6 radios to be connected to one PC, so up to 6 different RF channels may be utilized in the same area, or linked in via remote sites.

11) ***Low Cost Transponders***. The highly integrated *RV-M7 series GPS Transponder* has a radio, modem, and GPS in one assembly. The per-unit cost is lower than any other UHF AVL product on the market. There is no cost for a wireless carrier or satellite provider.

12) ***Secure***. All position transmissions are encrypted, so that only radios with the same pass-key code can communicate. The pass-key itself cannot be read out of the radio, so even a stolen radios will not make the system less secure. The *RavTrack PC* program is also administrator-rights protected, allowing a view-only user mode, and total-control for the administrator.

13) ***Filtered View***. *RavTrack PC*'s powerful display filtering allows the operator to filter the tracked vehicle list and the displayed icons on the map by over a dozen different parameters such as displaying only moving

vehicles, or alarming vehicles, or stationary vehicles, low-battery conditions, or emergency personnel, or ignition on.

14) ***Advanced Features***. Advanced features are configured when the Transponder is installed. The RavTrack Transponders have alarm inputs, status output pins for specialized applications.
All *RavTrack GX Transponders* report position, velicity, time, temperature, voltage, altitude, I/O status, alarms, GPS signal quality, and radio signal quality in each transmission, so the system operator has enormous visibility to the status and location of his tracked objects.

15) ***ESRI Shape Files***. ESRI shape files may be imported and overlaid on the map.

RavTrack PC Specifications:

Map Files

Any .jpg, .tiff, geo-tiff, or .gif graphics file
Photos, scanned maps, or screen captures may be used
User may easily switch between available maps stored on local hard drive
Comes with standard database of icons to display tracked objects
Supplied utility to calibrate user maps
Raveon map calibration service available
User may add custom icons to map file.

DataBases

Tracked Objects: Microsoft Access. One record for each tracked M7 Transponder.
Fields: ID, Name, Status, Time, Date of last report, Lat, Lon, Altitude, Alerts, Speed, Direction, Inputs, GPS status, Icon used, Voltage, Temperature, Radio Signal Strength
System Log File: Microsoft Access. One record for each position report received over the air.
Fields: Entry Number, ID, Status, Time, Date, Lat, Lon, Alerts, Speed, Altitude, Inputs, UTC time, Voltage, Temperature, RSSI, Operator Text
System Log Filter: Log all activity or log only moving objects.

Map Home Location

Center map on current position as reported by local GPS
Center map on a fixed lat-lon
Optionally draw circles around home location
On-click to re-center map on home location

Alerts Triggers (rule based):

Zone alert. entering or leaving a geo-fence
Low battery
Speeding
Idling too long
Stopped
Proximity to points of Interest on the map
Distance from home location

Alert Actions

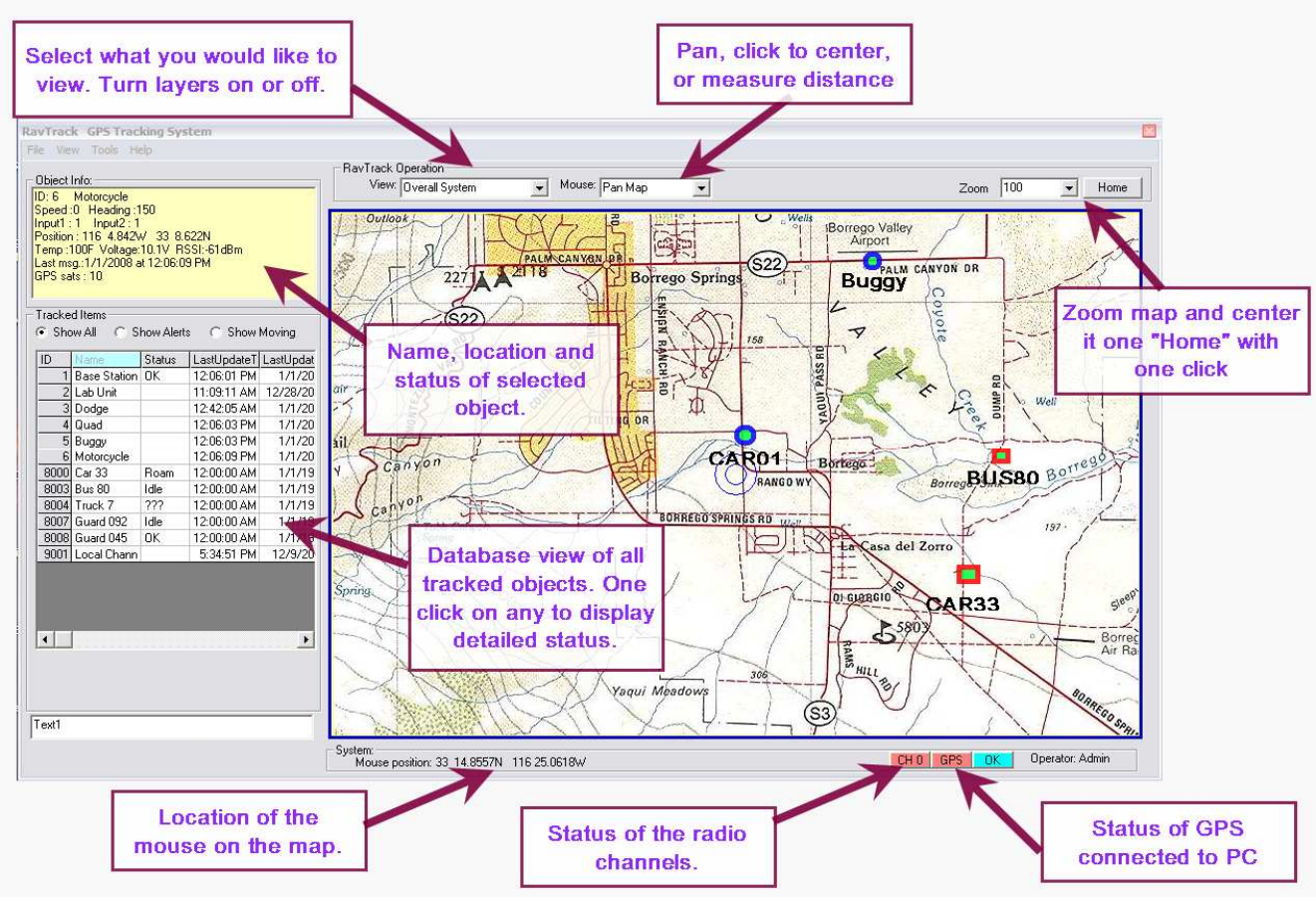
Message box pop-up showing ID and rule that caused the alert
Play a .wav file
Send an email
Execute a shell program

Communications:

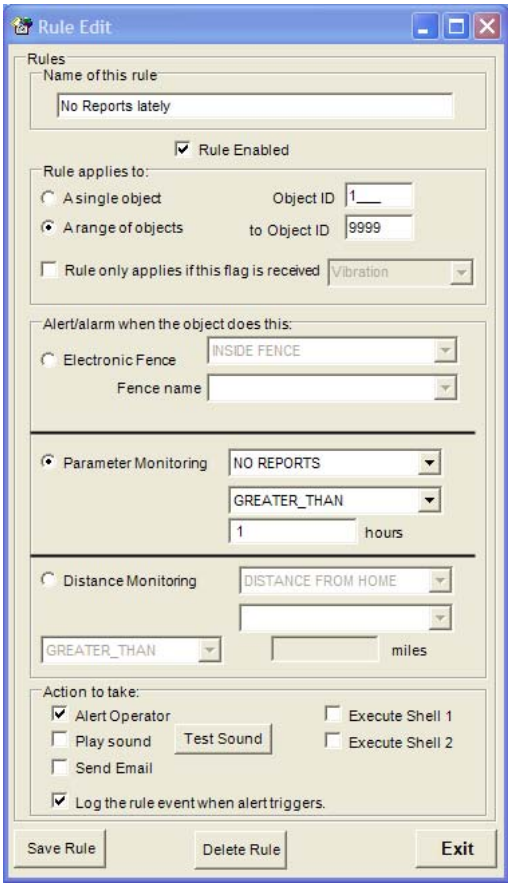
Radio Interface.....RS232 COM port
Maximum number of channels (open Com Ports): 6
Com port numbers supported 1-16
Protocols ..... Raveon $PRAVE, NMEA 0182

RavTrack PC Screen Shots:

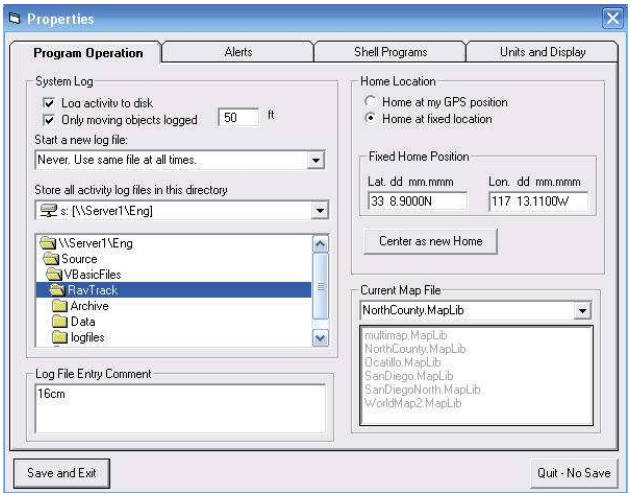
Main Screen.

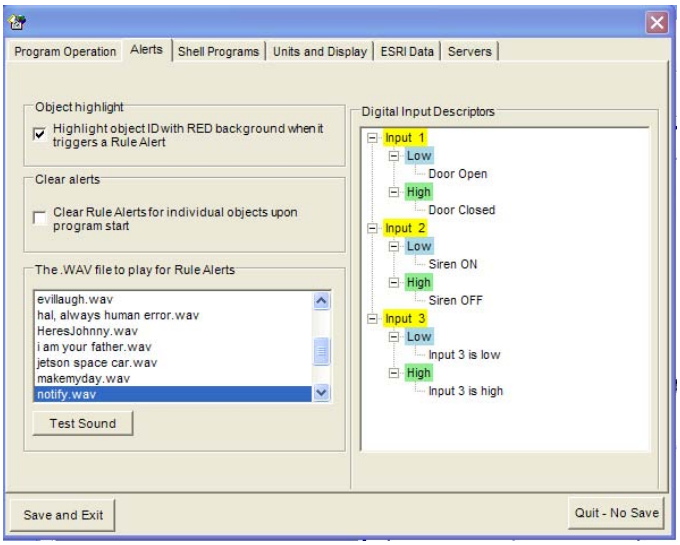

Select what you would like to view. Turn layers on or off.
Pan, click to center, or measure distance
Zoom map and center it one "Home" with one click
Name, location and status of selected object.
Database view of all tracked objects. One click on any to display detailed status.
Location of the mouse on the map.
Status of the radio channels.
Status of GPS connected to PC
RavTrack GPS Tracking System
RavTrack Operation
Object Info:
Tracked Items
Show All
Show Alerts
Show Moving
Borrego Springs
Buggy
CAR01
BUS80
CAR33
Mouse position: 33 14.9557N 116 25.0618W
CH 0
GPS
OK
Operator: Admin

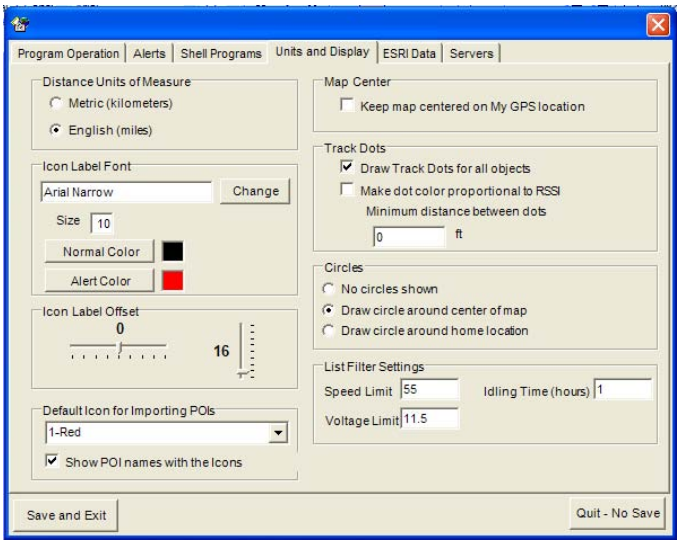
Rule Edit Screen



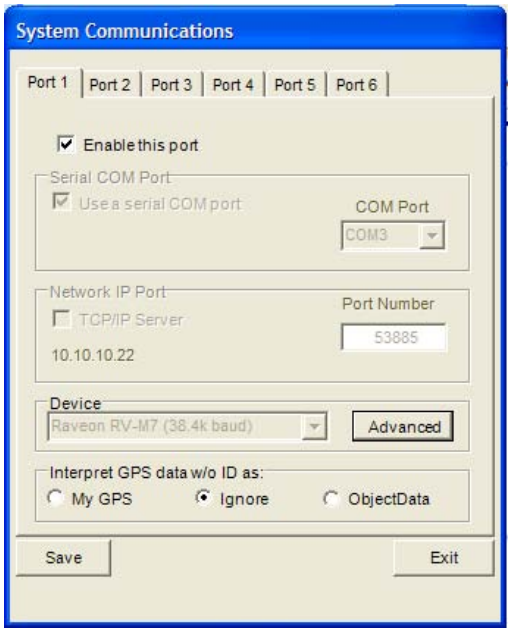
System Configuration Screens



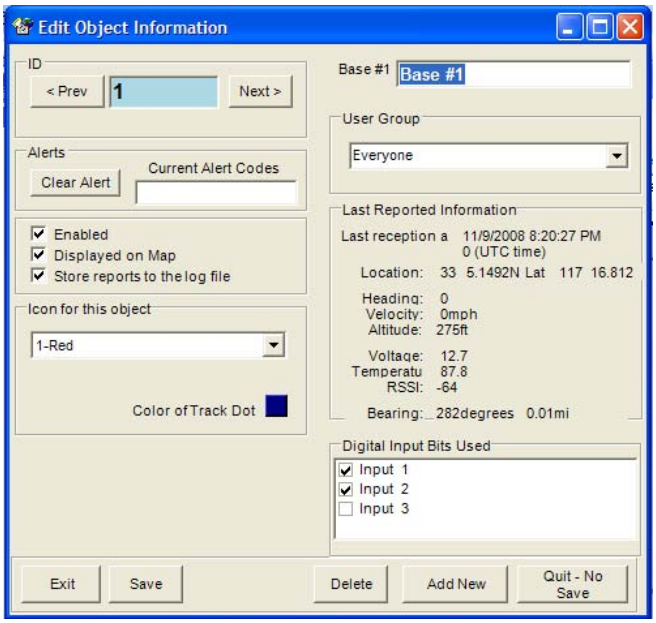




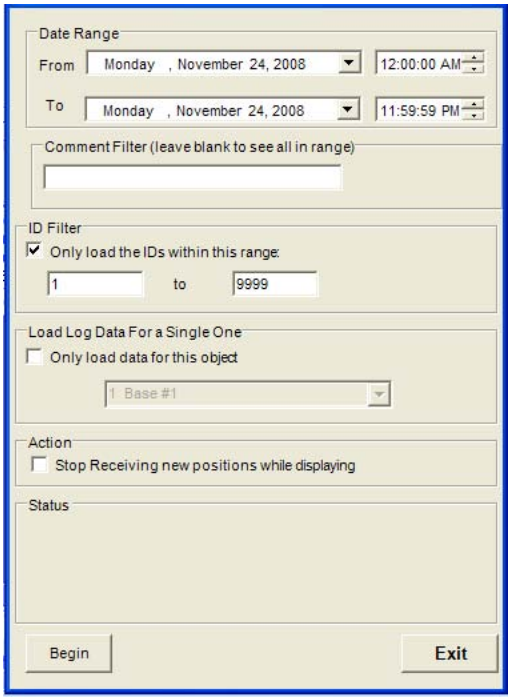
Radio Channel Configuration



Tracked Vehicle Information



Load Historical Log Data to Map



For More Information

For more information about this or any other Raveon product, call in the U.S.A. 1-760-727-8004 or visit us a www.ravtrack.com.

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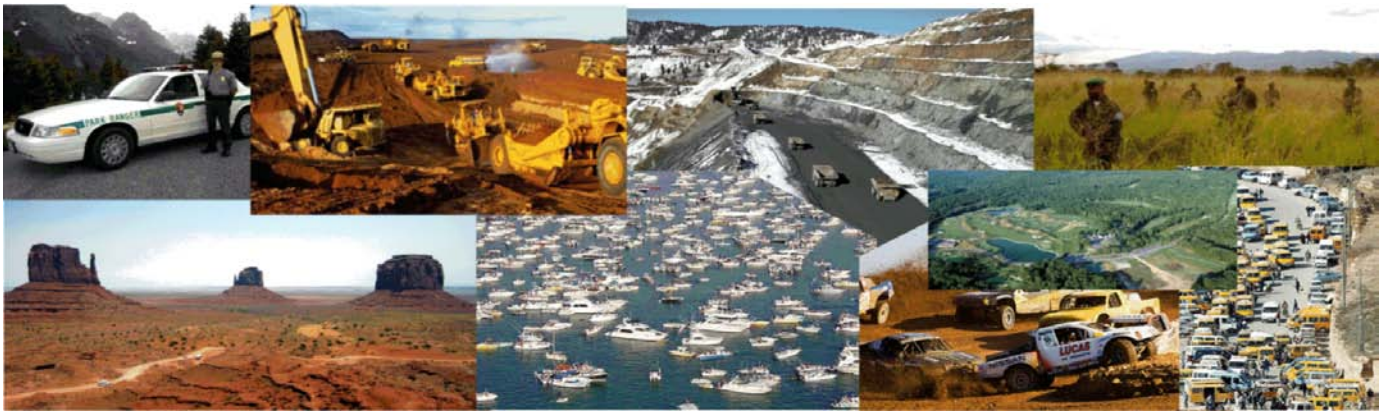
RV-M7-U-GX

M7 GX Transponder
UHF Tracking Radio/Modem

The heart of Raveon's Real-time Tracking Solution is the M7 GX GPS transponder—a 1/2-5 watt UHF wireless modem with built in GPS, NMEA input/output, and radio modem. An optional IP65 weatherproof enclosure is also available. For use in AVL and asset tracking applications, see www.ravtrack.com for a complete list of Raveon's GPS enabled products.

Preliminary Product Overview



The RavTrack™ Transponder lets you quickly locate: your co-workers, your trucks that break-down, your rented-boats, your stolen vehicle, a drowsy driver, nearest help, lost people, and slow-moving golfers.

It is the fastest real-time GPS tracking transponder available. It uses commercial UHF radio channels with no service fees, no monthly charges, and it works virtually anywhere.

Applications

Construction:	*Know where all your equipment is, and how it is being used. Quickly locate anyone, as soon as you drive onto the site.*
Public Safety:	*Know where your officers and first-responders are, ad who's closest to the scene. See the tactical situation in real-time, so you can respond instead of reacting.*
Mining:	*Watch your machinery at work, monitoring for improper speed, location, and usage.*
Vehicle Monitor:	*Track vehicles in real-time, monitor speed, door sensors, voltage, and operator behavior. Use the M7 GX for tracking, emergency location, and theft recovery.*
Off-road Racing:	*Quickly know where your chase truck and race-car are. Find them fast if it breaks or is stolen.*
Parks and Golf:	*Easily locate all other vehicles in the park or golf-course. The location display may be in any vehicle, at the ranger-station, or even with a hand-held GPS.*
Marine:	*Track all the vessels in your rental fleet, and ensure they are not abused, stolen, or misplaced. RADAR display can be used to display M7 position AND status.*

Features

Long-Range Operation

Operating in the UHF 450-470MHz frequency band, the *M7 GX Transponder* can communicate as far as 50 miles (depending upon terrain). All *M7 GX Transponders* also can store-and-forward repeat for wide-area coverage.

Real-time.

Position and status updates are available as quickly as every second. No other tracking system has as fast an update rate as RavTrack.

Complete.

Everything needed to track a vehicle or asset is provided. No secondary services like Internet, cell-service, GPRS, Edge, SMS, or satellite service is needed. Raveon is your one-stop-shop for a complete Tracking system.

Flexible Reporting

The M7 GX may be configured to transmit position and status reports at pre-set time intervals(programmable), when it has moved a certain distance(programmable), when an I/O changes, or a combination of these.

No monthly charges.

Because no external services are required, there are no recurring costs for a RavTrack system.

Works Everywhere.

RavTrack does not rely upon public wireless services, so RavTrack systems work in rural areas, mines, mountains, foreign countries, and deserts.

Simple to Interface

The *M7 GX Transponder* is very simple to use and works with a multitude of other software, plotters, and GPS displays including:

- *Lowrance GPS displays and navigation*
- *Garmin hand-held GPSs*
- *Any GPS with an RS-232 NMEA interface*
- *RavTrack PC software by Raveon*
- *Marine Radar Displays*
- *Your own custom application.*

Over-The-Air Diagnostics

The configuration and operation of a *M7 GX* may be remotely tested using over-the-air commands from any other *M7* in the system.

Secure

All position reports are 128-bit AES encrypted for secure communications. No other radio modem, Raveon's or otherwise, will be able to listen in or monitor positions without knowing the security key.

Very Low Power Consumption

The *M7 GX Transponder* has some of the lowest power-consumption numbers in the industry. A remotely controlled sleep mode allows it to be active and consume almost no power at all and an external "Ignition Sense" input is provided to remotely turn on/off the product and not loose GPS ephemeral data.

Rugged and Weather Proof

Available with optional IP65 rated weatherproof connections and enclosure. (-WX option), al models include protection against damage from over-temperature, high VSWR, and reverse voltage.

High Speed and High Efficiency

The *M7 GX Transponder* operates with fast over the air data rates of 4800 to 19200bps. Its fast-switching radio enables it to send up to 20 position-transmissions per second.

Proximity Alerts

Each M7 GX may be configured to transmit and alert, as well as signal an output circuit whenever it is in proximity of another M7 GX. Used for collision avoidance or theft security.

For More Information

For more information about this or any other Raveon product, call in the U.S.A. 1-760-727-8004 or visit us a www.raveontech.com.

For details on all of Raveon's AVL and Tracking products, please visit our RavTrack web site at www.ravtrack.com.

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How It Works

Fastest real-time location updates in the industry.

The *M7 GX Transponder* has many technological advantages over conventional tracking radios. These include:

Advanced modulation: Most tracking radios operate at 1200 or 2400 baud over the air. The M7 series operate at 4-8X that speed using CPFSK2/4 modulation for data rates as high as 19.2K over the air.

TDMA Channel Access: TDMA (Tim-Division Multiplexing) is built in every M7 GX radio modem. With TDMA, 100 vehicles may be tracked with 10-second updates, and no RF interference. Even when using a repeater!

Data Compression: All location transmissions are compressed, allowing not only location to be sent, but also voltage, temperature, input status, speed, direction, and time to be sent – and still take less air-time than most radios use to transmit their position.

Easy to use, and the M7 GX does it all.

The *M7 GX Transponder* may be user-configured for a variety of applications. One simple command is used to program it to work in any of these configurations:

Transponder: The *M7 GX* will periodically transmit its location, along with voltage, temperature, input status, speed, direction, and UTC time. It powers-down he radio and GPS when not in use, reducing its average current draw to less than 30mA.

GPS Display: The *M7 GX* will periodically transmit its location, along with voltage, temperature, input status, speed, direction, and UTC time. It will also receive the location of other *M7 GX* radios in its radio range for display on a GPS plotter or hand-held GPS connected to the *M7 GX*'s NMEA RS-232 interface.

RavTrack PC: The RV-M7 will periodically transmit its location. It will also output the location of other RV-M7 radios in its radio range for display on the *RavTrack PC* software program.

Plotter Display: If you already have a gps plotter, you may connect it to the RV-M7 with the –LX option. This gives the unit all the features of the –GX version with the GPS, but uses your GPS NMEA data feed as the source for its GPS signal. It will output the location of other *M7 GX* radios in its radio range for display on a GPS plotter or hand-held GPS connected to the RV-M7's NMEA RS-232 interface.

Repeater: Any *M7 GX* may also be a store-and-forward repeater. With a 3mS attack time, the repeated signal has only milliseconds of latency, and coverage can be 10s of miles.

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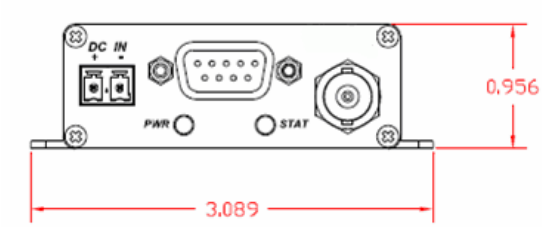
General Specifications

Model:
RV-M7-Ux-GX (x=band) (oo=options)
Size: 5.0 X 3.76W X 0.95H
Weight: 6 oz
Input Voltage: 9.5 – 16 VDC
Current draw:
GPS tracking, 1min updates: <30mA
GPS tracking, 10sec updates: <80mA
GPS and radio receiving data: <120mA
Transmitting data:
(2.7A @ 5w, 1.2A @ 2W typical)
Sleep (<25mA), Ignition off: (<10mA)
Frequency Bands:
A *403-434*MHz (for export)
B *419-440*MHz (for export)
C 450-480MHz (for US channels)
D 470-512MHz (for export)
Serial Port Baud Rates (programmable)
1.2k, 2.4k, 4.8k, 9.6k, 19.2k, 38.4k, 57.6k, 115.2k
Over-the-air baud rates (programmable)
-N 4.8k, 5142, 8K,9.6k
-W 4.8k, 8k, 9.6k, 19.2k
Operating Mode
Simplex or Half-duplex
Full Spec Operating Temperature range
-30°C to +60°C
TX-RX and RX-TX turn-around time
<3mS
Wake-up time
<500mS from OFF
<5mS from Sleep
Front Panel LEDs
Power
Status (Carr Det, TX, mode…)
RF I/O Connector
BNC (Female) (TNC on –WX version)
Power Cable
Raveon P/N: 1C738-1
Addressing
Individual address: 65,536
Options:
Waterproof Enclosure -WX option



Transmitter Specifications

RF Power Output ..... *500mW – 5.0 W programmable*
Maximum Duty Cycle ..... *100% @ 2W to 40C, 25% @5W (100% w/ optional heat sink)*
RF Bandwidth ..... 20MHz no-tune
TX Spurious outputs ..... *< -70dBc*
Occupied Bandwidth ..... *Per FCC*
FCC Emissions Designator ..... *11K0F1D (-N)*
Frequency Stability ..... *Better than ±1.5ppm*

Receiver Specifications

RX sensitivity (.1% BER) ..... 9600bps < -108dBm
4800bps < -116dB
RF No-tune bandwidth 20MHz
Alternate Channel Selectivity ..... -65dB
Blocking and spurious rejection ..... -75dB

Interface Specifications

Serial Interface Port

Connector Type DB-9
IO Voltage Levels RS-232
RX and TX data Transparent Async
Word length 7 or 8 bits
Format N, O, or E
Modem handshake signals RTS, CTS, CD
NMEA messages: TTL, GLL, WPT

User Configurable Parameters (overview)

Channel Number and Operating Frequency
Unit Address: *0001 thru 9999*
Baud Rate, parity, stop bits
GPS Update Rate: *1 – 9999 Seconds*
GPS report on movement: *0 – 9999 Meters*
GPS report on digital in *Enable/disable*
Digital Inputs (Gen Purpose or alarm) *2*
Digital Outputs *1*
Store-and-forward Repeating configuration
Encryption keyphrase *128 bits*
LEDs operation or disabled
Auto Status report on/off and interval.
Read DC voltage, current, forward RF power, VSWR
Remote PING
Serial Port Format: (*NMEA, RavTrack PC, RADAR TLL, or Lowrance Plotter*)

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